

## **Developing Landscape Benchmarks to Monitor Urban Growth in Puget Sound**

*Marina Alberti\*, University of Washington*

*Jeff Hepinstall, Bekkah Coburn, Michal Russo, Stefan Coe, Daniele Spirandelli,  
Urban Ecology Research Lab*

Keywords: landscape change, pattern metrics, benchmarks, urban sprawl, growth management

This paper develops and applies a set of landscape metrics as benchmarks for monitoring landscape changes associated with urban growth in central Puget Sound over the period 1991-1999. Selected metrics are examined and proposed as benchmarks for monitoring the effectiveness of the Washington State Growth Management Act and the progress towards its goals. Landscape metrics were selected among a large set of metrics developed in the field of Landscape Ecology to quantify and monitor landscape patterns. The study is based on a multi-year land cover classification and analysis of USGS Landsat Thematic Mapper (TM) at a three timesteps (1991, 1995, and 1999) at the regional and county level within and outside the urban growth boundary. Analysis of US Census data from 1990 and 2000 are used to infer relationships between population growth and impervious area. The findings show significant changes in landscape composition and configuration over the eight-year period with an overall increase in urban growth and decrease in forest cover. Conversion to developed land has occurred primarily in the low urban class and outside the urban growth boundaries. However the data show a simultaneous intensification of the urban area primarily between 1995 and 1999 and a decline in the medium intensity urban growth. The increase in low urban density development is consistent over the two time periods, however the intensification of the urban core has occurred more rapidly in the last five years over the previous 1991-1995 period.